UNITED STATES DEPARTMENT OF AGRICULTURE
Rural Electrification Administration
Washington 25, D. C.

SOME FACTS ABOUT THE USE OF ELECTRICITY ON THE FARM

Generally speaking, two kwh of electricity will pump 1,000 gallons of water per 100 feet of lift. (Purdue University: Electricity on the Fruit Farm.)

* * * * * * *

A southern college made tests to thoroughly mix 2,000 pounds of feed by hand vs. an electric mixer. To mix one ton of feed by hand required the work of two men for 76 minutes or a total of 152 minutes. With the electric mixer, it required 1 kwh to mix a ton of feed and 45 minutes of labor. (Georgia State College of Agriculture Bulletin No. 391.)

* * * * * * *

Not infrequently, one good irrigation during a week or 10 days drought at a critical time will result in enough of the crop being saved to pay for the irrigation plant in one year. (CREA, Vol. VII, Bulletin 1.)

* * * * * * *

A survey of 100 farm repair shops with an average of about $35 worth of shop equipment each saved $5.47 more per $100 of implement investment than those farms without repair shops. (Kentucky Agricultural Experiment Station Bulletin 345.)

* * * * * * *

It requires an average of 8 minutes to shear a sheep by hand; two-thirds as long to shear one with a hand-operated machine, and only a little over one-half as long with an electrically-operated clipper. (CREA, Vol. VII, Bulletin 1.)

* * * * * * *

During a 28-day test in January and February, steers supplied with warm water gained on an average of 8 pounds more per head. (Idaho Agricultural Experiment Station.)

* * * * * * *

Time spent in milking is reduced one-half by the use of milking machines. (University of Illinois, Department of Agricultural Engineering, Circular 44.)

* * * * * * *

From data secured during three years covering experiments from which it was possible to determine the overhead cost of milking a herd of an average of 22 cows . . . . the saving in labor over hand milking was 52.1%. (Iowa Agricultural Experiment Station Bulletin No. 248.)

* * * * * * *

To compete with the low cost of separating cream electrically, a man would have to crank for 15 minutes morning and evening or a total of 15 hours every month. (Illinois Agricultural Experiment Station Bulletin No. 332.)

* * * * * * *

> With electricity as a cooking fuel, the average time the housewife spends in cleaning and care of the range is reduced from 3 hours per week on a wood or coal range to 0.43 of an hour on an electric range, which is a saving of 2.57 hours per week. The total time saved by electricity in cleaning, laundry work and cooking alone amounts to seven hours a week -- or a saving of one-third the time required for those tasks without electricity. (Purdue University Extension Leaflet 187.)

* * * * * * *

An electric churn powered by a $\frac{1}{4}$-hp motor will consume about 1 kwh per 100 pounds of butter churned. If churning is done twice a week, there is a total saving of $3\frac{1}{2}$ days per year over hand churning. (Illinois Agricultural Experiment Station Bulletin 332.)

* * * * * * *

The time required for doing the average farm washing with the electric machine is only one-third that required with the washboard and about one-half that with the hand operated machine. This saving of time results in as much as 3 hours per week. Besides, the hardest part of the washing -- rubbing clothes or operating the hand machines -- is eliminated. (Kansas State College of Agriculture Bulletin No. 30.)

* * * * * * *

H. A. Miller, The Dalles, Oregon, pumps 20 gallons of water per day per cow electrically at a cost of only 1/10 cent per cow per month. His electricity costs only 90¢ a month to supply his 80 head of cattle with 20 gallons of water each per day (Rural Electrification News, November, 1944.)

* * * * * * *

Texas A & M College tests show that automatic drinking cups which permit cows to consume all the water they want, step up milk production 8 to 15%. (RE News, February, 1945.)

* * * * * * *

Lester Walker, Sac City, Iowa, says that with his electric motor, he elevated 8,000 bushels of corn for about $1 . . . (RE News, February, 1945.)

* * * * * * *

Mr. and Mrs. Ed Charvet, of Grandview, Washington, could tend to only five or six cows before they used electricity. Now, with an electric water heater and milking machine, they are milking 16 cows. (RE News, September, 1943.)

* * * * * * *

William Lamb, Bloomfield, Iowa, says: "It doesn't cost me quite $2 a month to milk 20 cows and to separate the milk. I couldn't get a hired hand that cheap." (RE News, January, 1944.)

* * * * * * *

From McCook, Nebr., comes word that Mrs. George R. Clark, having increased her poultry flock from 300 to 1,100 chickens, finds that her 10-year-old daughter can easily manage the daily work now that her three poultry houses are lighted and supplied with running water by electricity. (RE News, March, 1944.)

* * * * * * *

John Sparks, Mockville, N. C., says: "I am milking 33 cows -- two people do the milking in 1½ hours. Before putting in my electric milking machines, it took 4 hands 1½ hours to do the same work."
(RE News, November 1941.)

* * * * * * *

Warmed water (in the hen house) increases the value of each layer's productivity by about 15 cents to 30 cents a year, $40 more with 200 hens. (RE News, December, 1941.)

* * * * * * *

> It is certain that electric brooders require less labor for their operation than do brooders using other fuels. Requiring no fuel to be fed by hand and no oil tanks to be filled, electric brooders having thermostatic controls and "no voltage" alarms need much less attention (REA Farm Electric Equipment Handbook, 1937, No. 3)

* * * * * * *

The electrically driven cream separator is a time saver . . . Its unvarying speed means more cream separated, particularly during cold weather . . . Constant speed also results in the same butterfat test from day to day and a better grade of butter. (REA Electric Equipment Handbook, No. 6.)

* * * * * * *

A 1-horsepower motor can do the work of 10 men. (REA booklet "Electrifying Your Farm and Home.")

* * * * * * *

If H. L. Keadle, Forsyth, Georgia, didn't have electricity on his farm, he'd have to hire at least two more hands to take care of his 60-cow herd. (RE News, September, 1944.)

* * * * * * *

"My power costs me no more than the pay of a laborer," says Wylie Hemphill, owner of Lewiston, Idaho, limestone quarry. The quarry. . . will reach a year's total of 45,000 tons . . . (RE News, October, 1944.)

* * * * * * *

A recent survey of 650 users of barn cleaners shows that it takes less than one-fourth of the time to clean the barn with a barn cleaner than it did with previous methods. (An address by Floyd Keepers, executive secretary, Barn Equipment Association, August, 1951.)

* * * * * * *

Installation of an electric water system on an Ohio farm eliminated 175 manhours of carrying water to livestock during each annual five-month period when the cows remain in the barn. Installation of drinking cups also resulted in an increase of $2\frac{1}{2}$ percent daily in milk production. (Ira Miller, Farm Electrification Bureau, release 236.)

* * * * * * *

A recent 28-day test with a 12-cow herd recorded that cows fed barn-cured hay produced 2.88% more milk than those fed field-cured hay. Barn-cured hay also had better quality. (Ira Miller, release 235.)

* * * * * * *

Studies record that the use of automatic feeders will reduce chick-feeding time by as much as 50%. One experiment shows that layers will produce a dozen eggs with 7/10 of a ton less feed when fed automatically than when fed by hand. (Ira Miller, release 231.)

* * * * * * *

After the installation of a farm pressure water system, a herd of 23 cows increased its milk production by 3,117 pounds in a 6-month test period. Butterfat content of the milk went up 17.7% per cow. (Ira Miller, No. 222.)

* * * * * * *

A 1-horsepower motor can do the same amount of work in 1 hour for 1 kwh that a man can do in a 10-hour day. (Page 11. *)

* * * * * * *

An electric motor, for 5 cents, will milk 20 cows, separate 2,000 pounds of milk, pump 1,000 gallons of water or clean a 100-cow stable. (Page 11. *)

* * * * * * *

> To compete with an electric water pump, the farmer or his hired hand must work for about 3 cents an hour. He must pump about 1,000 gallons, or more than 4 tons, of water for this hourly wage. Electric water systems eliminate many hours of human labor and drudgery, improve the quality of many farm products through more sanitary operations, and increase profits through savings in labor cost, through maximum production from livestock, and through high quality farm products. (Page 15. *)

* * * * * * *

Dependable electrically operated irrigation pumps provide crop insurance for large acreages of our agricultural lands . . . The electric motor is the most convenient type of power for irrigation purposes . . . Electric power consumption ranges from $1\frac{1}{2}$ kwh an acre foot for each foot of elevation for the larger, more efficient plants to $3\frac{1}{2}$ kwh for the smaller installations. (Pages 20, 21. *)

* * * * * * *

Electric motor-driven drainage pumps have reclaimed many acres of land too flat to be drained by gravity . . . The electric energy used varies greatly, depending on the capacity of the pump, the vertical lift, and the efficiency of the system. (Pages 23, 24.. *)

* * * * * * *

> Probably no other electrical application saves more hard work and man hours on a dairy farm than does the milker. Reports show savings of from 50 to 65% in time and labor required to milk the herd . . . Good hired men are easier to keep when machine milkers are used. (Page 25 *)

* * * * * * *

The electric energy used (for milking machines) ranges from $1\frac{1}{2}$ to $2\frac{1}{2}$ kwh per month per cow. (Page 26. *)

* * * * * * *

The electric energy used to operate a wet tank milk cooler ranges from 3/4 to 1 kwh for each 10-gallon can. (P. 28. *)

* * * * * * *

The cost of operation (of a dry walk-in milk cooler) is approximately $\frac{1}{2}$ kwh for each 10 gallons of milk. (Page 30. *)

* * * * * * *

An electric water heater normally supplies from 3 to 4 gallons of hot water for 1 kwh, depending on inlet and outlet water temperatures. (Page 32.*)

* * * * * * *

Whether cows are hand- or machine milked, studies show that clipping helps to keep bacteria count down . . . Electric clippers will operate for about ten hours on one kwh of electricity. (Page 34. *)

* * * * * * *

> The electric utensil sterilizer kills bacteria on the milk pails, strainers and milking-machine parts to further assure clean, high quality milk . . . The electric energy needed averages from 2 to 3 kwh a day for 75 to 100 pounds of utensils. (Pages 35, 36. *)

* * * * * * *

A cow breathes 220 pounds of air a day which contain $1\frac{1}{2}$ to 2 gallons of water to be removed from the stable. A good ventilation system that uses both an exhaust fan and properly designed intakes controls the temperature and humidity in a stable for optimum milk production . . . Power consumption (for the electric fan system of ventilation) averages 2 kwh per month per cow. (Pages 39, 40. *)

* * * * * * *

An electric motor eliminates the daily hand-cranking of the cream separator, (so that) the operator can do some other work while the milk is running through the machine . . . Electric power consumption is low -- about ½ kwh for each 1,000 pounds of milk separated. (Pages 41, 42. *)

* * * * * * *

An electric churn will make 100 pounds of butter for an average of 1 kwh of electricity. (Page 44. *)

* * * * * * *

A milk house heater prevents water pipes from freezing and assures a supply of either hot or cold running water. It prevents ice formation on the floor, eliminates wet walls, provides more comfortable working conditions for the man washing the milk utensils, makes possible a higher quality milk as a reult of more sanitary conditions, and often helps hold the bacteria count down. Electric space heaters are clean, easy to install and control... The operating consumption ranges from 1,000 to 3,000 kwh a season. (Page 45.*)

* * * * * * *

> The milk-can hoist saves many a back ache by lifting the milk from the cooler to the floor or loading platform. It also prevents the possibility of workers slipping on wet milk-house floors . . . The electric energy used ranges from ¼ to ½ kwh a month per can. (Page 47. *)

* * * * * * *

Mechanical stable cleaners are used by thousands of dairymen in many states to remove manure from the stable gutter. Many farmers install the cleaners to help keep good farm hands, although in some instances there may be no cash saving or return on the investment . . . The saving in labor ranges from 25 to 50 percent over that required for hand cleaning and this releases many man hours throughout the year for other more profitable farm work or makes it possible to care for more cows with the same labor force... Electric energy used ranges from ½ to 1 kwh per month per cow. (Pages 49, 50. *)

* * * * * * *

The mechanical silo unloader has been developed recently to throw the silage automatically into the feed cart . . . With this unloader, there are no more daily trips to the top of the silo to pitch the silo to the chute door . . . A 3-horsepower size can be operated for about 20 minutes on a kwh of electricity. (Pages 51, 52. *)

* * * * * * *

A motor driven manure pump eliminates serious losses of animal fertilizer in the warmer dairy states. The value of this fertilizer has been estimated by some to be $30 a cow annually . . . The electric energy for a 3-inch liquid manure pump ranges from 2 to 3 kwh per hour of use. (Pages 54, 55. *)

* * * * * * *

> The cost of building and using an electric fence is from 1/5 to 1/3 that of the usual permanent fencing investment. The energy consumption is about 5 kwh a month. Controller units range in price from $15 to $45. (Page 62. *)

* * * * * * *

Hog breeders report that with the use of electric pig brooders, an average of one more pig has been raised in each litter. Experiment stations report a reduction of about 50 percent in losses by the use of the brooder which protects the little pigs and keeps them warm and dry . . . The cost of a pig brooder need not exceed $5 when home-built, or $15 when purchased as a manufactured product. The electric power used need not exceed 36 kwh for each litter when operated continuously for 10 days. (Pages 63, 64. *)

* * * * * * *

It has been estimated that about 5 percent of the newborn lamb flock can benefit from electric heat to prevent chilling and save the weak lambs . . . The cost of building a lamb brooder ranges from $5 to $15. The electric energy required ranges from 1 to 3 kwh for each lamb. (Page 66. *)

* * * * * * *

A portable conveyor elevator handles small grain, ear corn, baled hay or straw, potatoes, sacked feed, fertilizer, and many other farm products. It saves many hours of laborious and time-consuming work. A ½-horsepower motor on an 18-foot elevator will handle ear corn faster than two men can shovel it into the hopper. A 1-horsepower motor will handle from 400 to 500 bushels of shelled corn an hour, depending on the elevation . . . Operating costs are low -- for grain types, about ½ kwh for 100 bushels of grain. (Page 73. *)

* * * * * * *

> Motor driven corn driers that utilize both natural and heated air have saved many bushels of seed . . . The electric energy used to dry ear corn for feed without heat averages 1 kwh a bushel, and averages 1/5 kwh a bushel for seed corn using heated air. The total cost ranges from 10 to 15 cents a bushel. (Page 84. *)

* * * * * * *

A motor-driven corn sheller eliminates the labor required to shell ear corn and usually doubles the number of bushels that can be shelled by hand. Up to 24 bushels can be shelled in an hour . . . The power consumption for shelling 24 bushels of ear corn an hour is about ½ to 1 kwh for each 100 bushels of corn. (Page 88. *)

* * * * * * *

Electric power for the ensilage cutter and silo filler with a 5 or 7½-horsepower motor, will fill a 40-foot silo at the rate of from 6 to 8 tons per hour . . . Electric power required ranges from 3/4 to 1 kwh for each ton of silage. (Page 91. *)

* * * * * * *

Feed grinding on the farm reduces handling and hauling costs, requires less labor, and assures fresh feed. A 1-horsepower electric feed grinder has the capacity to grind feed for 50 cows a day and can be equipped to operate semi-automatically, leaving the farmer free for other chores . . . The electric power ranges from $\frac{1}{4}$ to 2 kwh for each 100 pounds of feed ground, depending on the rate and fineness of grinding. The total cost for grinding with an electric motor is about 5 cents a hundred pounds as compared with 15 cents, exclusive of the labor, for custom grinding. (Page 94 *)

* * * * * * *

An electric feed mixer saves time, labor and expense, encourages the use of different feed formulae to meet changing conditions and assures fresh feed at all times . . . Energy averages about $\frac{1}{2}$ kwh for each ton of feed mixed. (Page 98 *)

* * * * * * *

> With a hay-curing system that uses a motor-driven fan to force air through the crop . . . farmers may harvest more tons of high-quality grown forage. Hay-curing installations displace the labor often required for extra tedding or turning the hay in the field, and increase storage capacity. Forced air curing systems represent the first successful attempt to eliminate the tremendous hay-crop losses due to weather, to handling, and to fire from spontaneous combustion. . . . From 45 to 65 kwh will cure one ton of hay. (Page 99. *)

* * * * * * *

The motor-operated hay hoist can save the time of one person during hay harvest -- one of the busiest seasons of the year. It may also eliminate the need and use of a team or tractor, and save the time usually required to hitch and unhitch the team for use on the hay rope. . . The electric energy required to hoist a ton of hay averages about 1/3 kwh. (Page 101. *)

* * * * * * *

The portable farm motor replaces a man at the crank (of the seed and grain cleaner, or fanning mill) and operates it at a more uniform speed than can be done by hand. Such a cleaner and grader has all three advantages of many farm electrical appliances: namely, it saves labor, improves the quality of the crop and thereby increases farm profits . . . One kwh will clean and grade 60 bushels of grain. (Page 105. *)

* * * * * * *

Electric lights in the laying house have been used for many years to stimulate egg production when prices are highest. Formerly it was believed that increased production from the use of artificial lights was due to the lengthening of the day for the birds to consume more feed. More recent studies show that the stimulating effect of the light rays is more important than the extra feeding time provided . . . The electricity needed to light a pen for 100 birds ranges from 3 to 6 kwh a month during the lighting season. (Page 110.*)

* * * * * * *

> A water warmer for poultry with a built-in thermostat in the water pan or trough prevents the drinking water from freezing . . . The warmer eliminates the labor otherwise required to thaw frozen drinking containers or to empty them at night to prevent freezing ... The electric energy used averages about 15 to 20 kwh a month in the north temperate zone. (Page 113 *)

* * * * * * *

The electric chick brooder does away with tending fires and providing fuel supplies, eliminates fire hazards of other brooding methods, does not overheat the brooder house on warm days, does not give off fumes or consume oxygen needed by the chicks, stores easily, and often is the lowest cost method available to many poultrymen . . . The electric power for brooding each chick during the season will be from $\frac{1}{2}$ to 2 kwh, depending largely on the season of the year. (Page 119 *)

* * * * * * *

*Farm Electrical Equipment Handbook published by Edison Electric Institute, 1950.

January 29, 1952